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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
THOMPSON, BRADLEY E	
ART UNIT	PAPER NUMBER
2612	
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12/09/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/586,208	SIBER ET AL.	
	Examiner	Art Unit	
	BRADLEY E. THOMPSON	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 September 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *27-55* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *27-55* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 July 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/15/2009 has been entered.

Original claims 1-26 have been cancelled and replaced by 27-54 in preliminary amendment filed July 13, 2006. Claims 27, 42 have been amended and new claim 55 has been added. Claim 34 has been canceled. Therefore, claims 27-33, 35-55 are pending in the current application for examination.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Response to Arguments

3. Applicant's arguments with respect to claims 27, 42 have been considered but are moot in view of the new ground(s) of rejection. Applicant's arguments from previous filings have been addressed in the corresponding office action.

Claim Rejections - 35 USC § 103

4. **Claims 27-33, 35-41 and 55** are rejected under 35 U.S.C. 103(a) as being unpatentable

over Schneider et al. (US Patent 6,515,589; hereinafter referred to as Schneider) in view of Dolnick (US Patent 4,769,550) and further in view of Thuillard et al. (US Patent 5,381,130; hereinafter referred to as Thuillard).

With regard to independent **claim 27:**

Schneider is drawn to a smoke detector based on the scattered-light principle (claim 1). Schneider teaches a detector with an emitter and a receiver whose beams of emission and reception (reads on first radiation emitter-receiver with first beam) form an oblique angle and intersect in free space outside the detector body such that the intersection forms a scattering volume (figure 1). As a consequence of being able to sense smoke in free space, Schneider recites a detector that requires no optical labyrinth (Invention Background column 1).

However Schneider fails to teach multiple emitters and multiple receivers. In a similar field of endeavor, Dolnick teaches an optical smoke detector system which has a first emitter-receiver combination and a second emitter-receiver combination (reads on second radiation emitter-receiver with second beam) (figure 1 and Invention Summary column 1). Dolnick further teaches wherein the scattering volumes 6 may be separate, i.e., spatially distinct, for each emitter-receiver combination (reads on scatter volumes spatially separated) (lines 42-44 column 2).

Hence, it would be obvious by one of ordinary skill in the art at the time of the invention to modify Schneider by providing multiple emitter-receiver combinations, as taught by Dolnick, for the purpose of distinguishing smoke from extraneous matter (see Thuillard column 5 lines 13-20). However, Schneider and Dolnick fail to disclose a first and second radiation source opposed at 180 degrees and a first and second radiation receiver opposed at 180 degrees.

In an analogous art, Thuillard is directed to an optical smoke detector which can compensate for extraneous matter and thus prevent false alarms. Thuillard teaches that smoke is spatially homogeneous whereas foreign matter or objects are non-homogeneously distributed (column 2 lines 59-65). Thuillard exhibits multiple emitters and receivers (figures 1-4). In particular, he exhibits a first 7 and second radiation detector 8 diametrically opposed at 180 degrees (figure 2) (column 6 lines 36-37) as well as a first 2 and second radiation emitter 22 diametrically opposed at 180 degrees (figure 4) (column 7 lines 54-60) (reads on wherein the first radiation transmitter and the second radiation transmitter are oriented 180° from one another; and wherein the first radiation receiver and the second radiation receiver are oriented 180° from one another).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Schneider and Dolnick with the emitter-detector orientation of Thuillard since it would be obvious to try with a reasonable expectation of success.

Schneider exhibits a processor 7 (figures 1 and 2) tied to transmitter control 5 which in turn is tied to light transmitter 3 and Dolnick recites multiple light emitter-receivers. It would be obvious to one of ordinary skill to have the processor exert control over multiple emitters as taught by Dolnick (reads on a microcomputer to selectively control the first and second radiation transmitters). Schneider further indicates receiver evaluating device 6, (figure 1) which is tied to processor 7, has an ADC (analog/digital converter) (column 4 lines 25-26) (reads on the microcomputer analyzing the first and second scattering volumes through an analog-to-digital converter).

With regard to **claim 28:**

The smoke detection system of Schneider, Dolnick and Thuillard disclose everything as applied above (see claim 27). In particular, although not explicitly recited in Schneider as being flush with a ceiling, it is fairly suggested since cover plate 3 can be affixed flush to the ceiling and all other components situated in a recess above (figure 1).

With regard to **claim 29:**

The smoke detection system of Schneider, Dolnick and Thuillard disclose everything as applied above (see claim 27). A cover plate 3 is recited in Schneider (lines 57-63 column 3).

With regard to **claim 30:**

The smoke detection system of Schneider, Dolnick and Thuillard disclose everything as applied above (see claim 27). As stated in the analysis of claim 27, Schneider recites no optical labyrinth is required (column 1 lines 11-12) and, as such, the claim 30 is rejected.

With regard to **claim 31:**

The smoke detection system of Schneider, Dolnick and Thuillard disclose everything as applied above (see claim 29). As discussed in the analysis of claim 27, Dolnick teaches scattering regions that are separate from each other which includes, in three-dimensional space, varying distances from the cover plate (column 2 lines 42-43).

With regard to **claim 32:**

The smoke detection system of Schneider, Dolnick and Thuillard disclose everything as applied above (see claim 29). However, Schneider and Dolnick are silent on a third light emitter-receiver combination.

Thuillard teaches, based on homogeneity, multiple light emitters and light receivers (reads on third light emitter-receiver and third scatter volume) can be disposed such that the

distinction between light scattered by extraneous matter cam be made relative to smoke (column 5 lines 13-20). Further still, Thuillard teaches monitoring of any increase in surface reflections due to surface deposits (column 1 lines 65-68) and also recites whereby fields of view of two receivers encompass different surface portions (column 2 lines 11-15) .(reads on third scatter volume includes portion of the surface area of cover plate).

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the apparatus of Schneider and Dolnick, as taught by Thuillard, in order to prevent false alarms due to soiling of detector surfaces (Thuillard column 2 lines 49-56).

With regard to **claim 33:**

The smoke detection system of Schneider, Dolnick and Thuillard disclose everything as applied above (see claim 27). In particular, Schneider and Dolnick both exhibit angles less than 180 degrees between first and second beam paths. (figure 1: Schneider and Dolnick).

With regard to **claim 35:**

The smoke detection system of Schneider, Dolnick and Thuillard disclose everything as applied above (see claim 27). As presented in the analysis of claim 32, Thuillard recites a plurality of emitter-receivers (column 5 lines 13-20) to test the homogeneity of an aerosol. It would be obvious to combine emitter beams with fields of view from different receivers (reads on forms two additional scatter volumes) and get a better read on the distribution of particulates. Hence, forming additional scatter regions is inherently disclosed by Thuillard.

With regard to **claim 36:**

The smoke detection system of Schneider, Dolnick and Thuillard disclose everything as applied above (see claim 35). Thuillard recites scatter regions at varied distance from radiation

source (reads on different distance from cover plate) (column 2 lines 5-8). As noted in the analysis of claim 31, Dolnick recites the same.

With regard to **claim 37:**

The smoke detection system of Schneider, Dolnick and Thuillard disclose everything as applied above (see claim 36). In particular, scattering angles which are more acute (reads on smaller scatter angle) are a natural consequence of a scatter region separated by a larger distance from the radiation source. Varied distance is taught by Thuillard as noted in claim 36 above.

With regard to **claim 38:**

The smoke detection system of Schneider, Dolnick and Thuillard disclose everything as applied above (see claim 27). Specifically, Dolnick exhibits a holder (figure 1) for accommodating first and second light emitter and receiver.

With regard to **claim 39:**

The smoke detection system of Schneider, Dolnick and Thuillard disclose everything as applied above (see claim 38). Dolnick exhibits a holder (figure 1) for containing light emitters and receivers in recesses at predefined angles.

With regard to **claim 40:**

The smoke detection system of Schneider, Dolnick and Thuillard disclose everything as applied above (see claim 35). In particular, Dolnick teaches an arrangement of light emitters and receivers via the holder such that a small amount of light from a collimated beam (column 3 lines 30-33) is directly received by a photo-detector (reads on window in holder allows direct passage of light) for the purpose of functional test (figure 1). Dolnick further teaches a fiber optic light guide may be used to direct a small amount of light directly to a photo-detector

(column 3 lines 34-36).

With regard to **claim 41:**

The smoke detection system of Schneider, Dolnick and Thuillard disclose everything as applied above (see claim 35). In general, it is widely accepted in the art that structural elements, e.g., containment chambers and labyrinths, absorb light so as to prevent false alarms (reads on holder material absorbs radiation). In particular, Thuillard recites optical labyrinths in the art that largely absorb incident light (column 1 lines 43-45).

With regard to **claim 55:**

The smoke detection methods of Schneider, Dolnick, and Thuillard disclose everything as applied above (see claim 27). Specifically, Thuillard teaches the electrical output signals of radiation detectors 7 and 8 (figures 1 and 2) are amplified (column 6 lines 36-39) and fed to op-amps 16 and 17 (figures 9-11). As is accepted in the art, op-amps are capable of filtering based on their pole-zero characteristics (transfer function) (reads on further comprising an electronic circuit system to filter and amplify a signal sent by one of the first radiation receiver and the second radiation receiver).

5. **Claim 42-54** are rejected under 35 U.S.C. 103(a) as being unpatentable over Schneider, Dolnick and Thuillard and further in view of Politze et al. (US Patent 6,218,950; hereinafter referred to as Politze).

With regard to independent **claim 42:**

The smoke detection system of Schneider, Dolnick, and Thuillard disclose everything as applied above. Although Schneider suggests a method for comparing results from different

scatter regions (reads on obtaining scatter values from two different regions in space) (Schneider column 6 lines 14-19), he is silent on processing details. As discussed in claim 32, Thuillard teaches homogeneity as a means for distinguishing smoke from foreign objects (reads on inferring presence of smoke versus foreign body). Comparing scatter regions as a measure of homogeneity is inherent in the disclosure of Thuillard as well.

Dolnick recites "Simply described, it is two photoelectric detection systems of conventional design mounted together. They both make measurements for smoke, but by operating them sequentially and alternately, they each also provide test signals for the other to test the other's light detection capability in order to confirm that each is properly operating. This novel method provides for the testing of every component and thus provides a fully failsafe smoke alarm" (Summary of the Invention column 1 lines 44-53) (reads on checking the fire detector for operability; performing a function check of a set of transmitters and a set of receivers).

In an analogous art, Politze is drawn to an optical smoke detector which takes the ratio of scatter readings from forward and backward angles and uses the ratio (reads on comparing scatter values to one another) as a means for determining the presence of smoke as well as inferring the type of smoke (column 2 lines 10-12 lines 16-25 lines 59-61).

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the methods of Schneider, Dolnick and Thuillard, as taught by Politze, for the purpose of distinguishing smoke from interfering objects which can cause false alarms (Thuillard).

Schneider teaches how smoke particle size can been determined with use of scattering technique and interpretation (column 2 lines 8-27) (reads on determining size of smoke). Politze

discloses how types of smoke or dust and vapor can be distinguished (column 2 lines 44-58) and how light and dark aerosols can be detected (column 2 lines 14-36) (reads on determining type and color of smoke). Distance is taken to mean distance of a scattering volume from the smoke detector since there is no other interpretation which is supported by applicant's disclosure. Thuillard recites related art which discloses multiple fields of view which lie at different distances from the radiation source and, in which, the radiation differs in the presence of smoke inferring the ability to distinguish distance (column 2 lines 3-15) (reads on determining distance of smoke).

With regard to **claim 43:**

The smoke detection methods of Schneider, Dolnick, Thuillard, and Politze disclose everything as applied above (see claim 42). Specifically, simultaneous activation is fairly suggested by Schneider (column 6 lines 14-19).

With regard to **claim 44:**

The smoke detection methods of Schneider, Dolnick, Thuillard, and Politze disclose everything as applied above (see claim 42). Specifically, sequential measurements are recited by Dolnick (column 1 lines 47-48).

With regard to **claim 45:**

The smoke detection methods of Schneider, Dolnick, Thuillard, and Politze disclose everything as applied above (see claim 42). As explained in the rejection of claim 32, Thuillard teaches monitoring of any increase in surface reflections due to surface deposits (reads on scatter volume includes partial area of surface) (column 1 lines 65-68). Furthermore, producing a threshold for a clean surface (reads are creating an idle signal for a clean surface) is fairly

suggested by Thuillard (column 1 lines 65-68 and column 9 lines 46-49).

With regard to **claim 46:**

The smoke detection methods of Schneider, Dolnick, Thuillard, and Politze disclose everything as applied above (see claim 45). As explained in the rejection of claim 45, Thuillard teaches wherein if a threshold is breached (reads on comparing scatter value taken at later instant with one taken at earlier instant), then soiling of a detector surface can be inferred (column 1 lines 65-68).

With regard to **claim 47:**

The smoke detection methods of Schneider, Dolnick, Thuillard, and Politze disclose everything as applied above (see claim 46). Thuillard teaches adaptive thresholding (reads on limiting value predefinable for second scatter value) whereby smoke can be detected in the presence of surface soil (column 9 lines 46-49) and a trouble signal is generated to indicate cleaning of detector (reads on request for maintenance of fire detector)(column 9 lines 62-64).

With regard to **claim 48:**

The smoke detection methods of Schneider, Dolnick, Thuillard, and Politze disclose everything as applied above (see claim 42). Specifically, Politze teaches a method which accounts for aging (column 5 lines 11-14) and ambient temperature (column 5 lines 18-25) by integrating quiescent values (reads on infer aging of an emitter or changes in ambient temperature when second scatter value falls below threshold).

With regard to **claim 49:**

The smoke detection methods of Schneider, Dolnick, Thuillard, and Politze disclose everything as applied above (see claim 48). As explained in the rejection of claim 48, Politze

teaches a method whereby age and ambient temperature are compensated for (reads on correction factor). Furthermore, as explained in claim 42, Politze teaches the method for taking the ratio of scatter values (reads on quotient).

With regard to **claim 50:**

The smoke detection methods of Schneider, Dolnick, Thuillard, and Politze disclose everything as applied above (see claim 49). Adjusting the current to a light emitter a compensation technique, as taught by Thuillard, which is widely acknowledged in the art.

With regard to **claim 51:**

The smoke detection methods of Schneider, Dolnick, Thuillard, and Politze disclose everything as applied above (see claim 42). Claim 51 is rejected for the same reasons as presented in claim 31 since the method is as inherent variation of the apparatus in claim 31.

With regard to **claim 52:**

The smoke detection methods of Schneider, Dolnick, Thuillard, and Politze disclose everything as applied above (see claim 42). Politze further teaches a method for determining types of smoke using ratios of scatter values (column 2 lines 6-9). As explained in the rejection of claim 42, Thuillard teaches the method for recognizing objects.

With regard to **claim 53:**

The smoke detection methods of Schneider, Dolnick, Thuillard, and Politze disclose everything as applied above (see claim 42). As explained in the rejection of claim 42, Politze teaches the method of calculating ratios (reads on quotients) to compare scatter values

With regard to **claim 54:**

The smoke detection methods of Schneider, Dolnick, Thuillard, and Politze disclose

everything as applied above (see claim 42). As explained in the rejection of claim 44, .a method of sequential operation is recited by Dolnick (reads on selective control).

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRADLEY E. THOMPSON whose telephone number is (571)270-5583. The examiner can normally be reached on M-F 8 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Wu can be reached on 571-272-2964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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